

Appl. No. 10/531,294  
Amendment dated May 19, 2009  
Reply to Office Action of January 27, 2009

## **REMARKS**

In the January 27, 2009 Office Action, claims 1 and 2 stand rejected in view of prior art. No other objections or rejections were made in the Office Action.

### ***Status of Claims and Amendments***

In response to the January 27, 2009 Office Action, none of the claims are being amended by the current Amendment. Thus, claims 1 and 2 are pending, with claims 1 and 2 being the only independent claims. Reexamination and reconsideration of the pending claims are respectfully requested in view of above amendments and the following comments.

### ***U.S. Patent No. 4,412,788 (Shaw et al.) Not listed on PTO-892***

U.S. Patent No. 4,412,788 (Shaw et al.) is not listed on a form PTO-892. However, the outstanding Office Action relies on this reference to reject the claims. Applicants respectfully request that U.S. Patent No. 4,412,788 (Shaw et al.) be listed on a form PTO-892 attached to the next communication from the U.S. Patent and Trademark Office.

### ***Rejections - 35 U.S.C. § 103***

In paragraph 5 of the Office Action, claims 1 and 2 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,351,160 (Kountz et al.) in view of U.S. Patent No. 4,412,788 (Shaw et al.). In response, Applicants respectfully traverse the rejection as explained below.

Independent claims 1 and 2 clearly require, *inter alia*

- The variable inner volume ratio valve which changes completion time of a compression step in a screw compression section to make inner volume ratio variable; and
- The optimum inner volume ratio output section controlling the opening degree of the variable inner volume ratio valve based on the suction side pressure, the discharge side pressure, the signal representing the rotational frequency, the driving voltage and the driving current of the

electric motor (or the driving power of the electric motor), and a position of the variable inner volume ratio valve.

Clearly this arrangement is *not* disclosed or suggested by the Kountz et al. patent and/or the Shaw et al. patent, whether taken singularly or in combination.

The Office Action asserts that the slide valve member 40 of the Kountz et al. patent forms a variable inner ratio valve as claimed. However, the slide valve member 40 of the Kountz et al. patent regulates the volume of gas trapped in the compression chamber prior to compression to adjust the timing of unload. See column 6, lines 30-35 and the abstract of the Kountz et al. patent. Likewise, the slide valve member 24 of the Shaw et al. patent regulates the volume of gas trapped in the compression chamber prior to compression to adjust the timing of unload (see column 5, lines 1-4 and 36-40, and Figure 1). Thus, the slide valve members 40 and 24 of the Kountz et al. patent and the Shaw et al. patent are for adjusting bypassing timing for unload to regulate the volume of gas trapped in the compression chamber. Accordingly, neither the slide valve member 40 of the Kountz et al. patent nor the slide valve member 24 of the Shaw et al. patent constitutes a variable inner volume ratio valve which changes completion time of a compression step in a screw compression section to make inner volume ratio variable whatsoever. Thus, the hypothetical combination of the Kountz et al. patent and the Shaw et al. patent cannot disclose a variable inner volume ratio valve in combination with an optimum inner volume ratio output section controlling the opening degree of the variable inner volume ratio valve based on the suction side pressure, the discharge side pressure, the signal representing the rotational frequency, the driving voltage and the driving current of the electric motor (or the driving power of the electric motor), and a position of the variable inner volume ratio valve, as set forth in independent claims 1 and 2.

With the variable inner volume ratio valve which changes completion time of a compression step in a screw compression section to make inner volume ratio variable according to the claims 1 and 2 of the present application, high compressor efficiency is obtained without unload control in regulating the capability of the compressor. Both the Kountz et al. patent and the Shaw et al. patent are incapable of this advantage.

Under U.S. patent law, the mere fact that the prior art can be modified does *not* make the modification obvious, unless an *apparent reason* exists based on evidence in the record

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or scientific reasoning for one of ordinary skill in the art to make the modification. See, KSR Int'l Co. v. Teleflex Inc., 127 S.Ct. 1727, 1741 (2007). The KSR Court noted that obviousness cannot be proven merely by showing that the elements of a claimed device were known in the prior art; it must be shown that those of ordinary skill in the art would have had some "apparent reason to combine the known elements in the fashion claimed." Id. at 1741. In this case, even if the Kountz et al. patent and the Shaw et al. patent are combined as suggested in the Office Action, the hypothetical combination lacks Applicants' unique arrangement of a variable inner volume ratio valve which changes completion time of a compression step in a screw compression section to make inner volume ratio variable in combination with an optimum inner volume ratio output section controlling the opening degree of the variable inner volume ratio valve based on the suction side pressure, the discharge side pressure, the signal representing the rotational frequency, the driving voltage and the driving current of the electric motor (or the driving power of the electric motor), and a position of the variable inner volume ratio valve, as set forth in independent claims 1 and 2.

Therefore, Applicants respectfully request that this rejection be withdrawn in view of the above comments.

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In view of the foregoing amendment and comments, Applicants respectfully assert that claims 1 and 2 are now in condition for allowance. Reexamination and reconsideration of the pending claims are respectfully requested.

Respectfully submitted,

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